Symons's

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THE RAINFALL OF 1907.

The rainfall of December has proved to be considerably in excess of the average in all parts of the country, so that the year—which at the end of November promised to be a dry one—has turned out to be one of average rainfall. It is too soon as yet to give a very detailed account of the distribution of rain over the country, but a considerable tract round the estuary of the Thames had less than 20 inches, and the line of 25 inches pursues much the same course on the map as it does on a map of average rainfall. The last column of the Table on p. 245 assumes, this month, the form of a table of ratios of annual rainfall to the average of 30 years, and a map has been constructed from these data, and about 40 supplementary stations which it has been possible to obtain averages. When the figures are set out on this map, it is seen that the whole east coast of Great Britain had less than the average fall of rain, the dry strip widening towards the south, and including the south coast to a point west of Brighton. The extreme fringe of the west of Scotland, the Isle of Man, the Lake District, the coasts of Lancashire, Cheshire and North Wales, the coast of South Wales, and the western horn made up of Cornwall, Devon, Somerset and Dorset, were also drier than in an average year; and the dry belts of the east and west met in a narrow strip through Manchester, Sheffield and Lincoln. In three small areas the rainfall was more than 10 per cent. below the average; these were in North Wales and the Wirral peninsula, along the east coast from the Tees to the Wash, and in the east of Kent; but no station showed a greater deficiency than 13 per cent. The portions of Great Britain where the rainfall exceeded the average included nearly the whole of Scotland, the Pennine region, Wales and the Midlands, with an extension southwards to the coast of Hampshire. Apparently only the parts of Scotland south of Oban and west of Edinburgh had an excess greater than 10 per cent.; and in England, except for a patch in the extreme north-west, there were only a narrow strip in the North Midlands and a spot in Hampshire which were as wet. It is rare to see local differences in the intensity

of rainfall so unobtrusive as in 1907. In Ireland, only a little of the north-east had a rainfall which differed from the average by so much as 10 per cent. The rainfall of the north, of part of the west, and of a patch in the south-east, slightly exceeded the average; in the rest of the country it was slightly less than the average.

The general rainfall for the whole of the British Isles comes out as 1 per cent. above the average, which for all practical purposes may be taken as the average, exactly the same as in 1906. The year 1906 was generally considered to be dry and fine, because the holiday months were dry, and 1907 has generally been stigmatised as wet and wretched, probably because in most parts of the country, as in London, there were a great many days with rain, and, perhaps, because a larger proportion of the rain than is usual fell in the daylight hours. Both years, however, practically coincided with the average, a result that has never previously been recorded. This fact is interesting as illustrating a point on which stress has been laid in these pages and in "British Rainfall" for several years, *viz.*, that the sequence of a wet year following two dry years which has held good for the British Isles since 1889 would sooner or later break down, and could not be relied upon as a basis for prediction. It does not follow that there is not a periodicity in the distribution of annual rainfall; but it seems as if the rhythm were just now changing its time. Expressing the difference from the average in percentages, + for wet years and — for dry years, the sequence taken from the Table on p. 171 of "British Rainfall, 1906," runs :—

1889 —10	1892 — 5	1895 — 7	1898 — 2	1901 —11	1904 — 9
1890 — 3	1893 —12	1896 — 6	1899 — 5	1902 —17	1905 —14
1891 + 5	1894 + 5	1897 + 3	1900 + 8	1903 +26	1906 — 1
					1907 + 1

Splitting up the country into large divisions, adopting the mean of the selected stations in each division as giving its general rainfall (which it is safe to do as the stations are nearly equally spaced), and expressing the average by 100 in each case, the result is—

General Rainfall in 1907. Average = 100.

England	Wales	Scotland.	Ireland.	British Isles.
98	101	106	102	101

The monthly incidence of rain is always interesting, for in farming, water-supply, and in all pursuits where rainfall is a determining factor, the way in which the rain falls and the time at which it comes are often more important than the total amount. The table which follows shows concisely how the rainfall of the months varied from their average in the great divisions of the United Kingdom. It is a summary of the monthly percentage column of the detailed tables published regularly in this Magazine :—

	England & Wales.	Scotland.	Ireland.	British Isles.
	per cent.	per cent.	per cent.	per cent.
January.....	55	74	48	58
February ...	78	98	85	84
March.....	71	115	115	91
April	147	118	130	137
May	150	160	**158**	**154**
June	133	**181**	156	149
July	77	73	85	78
August	82	125	90	94
September...	25	37	42	32
October	**154**	129	138	145
November...	86	85	98	88
December ...	134	109	117	125
Year	99	106	102	101

Taking the British Isles together, five months of 1907 were wet and seven dry as compared with the average, and the most prominent features of the year were the very wet three months of spring and early summer and the extremely dry September.

METEOROLOGICAL SERVICE IN JAMAICA.

We learn from Mr. Maxwell Hall that the colonial meteorological service in Jamaica, which has been in abeyance since 1899, has been re-established, and that he has again taken charge of it. We heartily congratulate the Government of Jamaica on this happy event, for although the generosity of the United States Weather Bureau maintained a complete observing station in Kingston from 1898 to 1903, and a less fully equipped station down to date, the recording of local weather is a duty which no government ought to neglect. We gladly quote from the interesting article in the *U.S. Monthly Weather Review* for July, 1907, by Mr. D. T. Maring, who represented the U.S. Weather Bureau at Kingston after the earthquake in January, 1907, the following message from Sir Sydney Olivier, the Governor, to the Legislative Council of Jamaica :—

Honourable Gentlemen,

I have the honour to inform you that I have received a resolution passed by the Jamaica Agricultural Society at their last half-yearly general meeting, inviting the attention of the Government to the need for restoration of the meteorological service in this Island. I have consulted my Privy Council on this subject, and they agree with me in thinking that the time has come when this service should be restored. The meteorological service, which had existed since the year 1880, was, from the urgent necessity for economy, practically abolished in the year 1899, when it was reduced to the compilation of rainfall statistics; and the total abolition of any separate

vote for this latter kind of work occurred in the year 1902, when such work was allotted to the staff of the Island Chemist.

The restoration of the service as it existed for many years would enable us again to have a useful local system of storm warnings, together with complete meteorological returns for the capital of this Island, which, for some years, has had to do without them. It would also enable a revision to be made of the rainfall maps of the Island which were prepared some years ago after twenty years' registration, but which should now be compiled on the results of some forty years' registration. The scheme now proposed would also include a modest time service, whereby the correct time could be notified throughout the Island from the Island telegraph office in Kingston. Other work of a miscellaneous and useful character would from time to time be performed. The chief reason, however, which impels me to suggest to you at this particular time the desirability of the restoration of the weather service is the first one set out above, viz., that we should have an effective system of local storm warnings. At the time of the abolition of the old service, the Island was fortunate in having had recently established in its midst a well-equipped station with a resident staff supported by the United States Government, and the Island benefited by the generosity of that Government. Since then that service has been reduced and the staff withdrawn, and in the public interest a local system of storm warnings seems necessary. The value of such a system is of two kinds—one positive, the issuing of notices of approaching cyclones, and the other negative, the issuiug of notices to dispel false alarms. It has been represented to me that on the occasion of the last cyclone in August, 1903, one firm alone in a seaport town of Jamaica lost in the value of lighters about four times the annual cost of the weather service, which it is stated would have been saved if the old weather service with its system of telegraphic warnings throughout the Island had then been in existence. Doubtless there are other instances of a like nature within the memory of honourable gentlemen. The dispelling of false alarms is also of great value, and is often the means of saving money which would otherwise be needlessly expended.

A resolution will therefore be submitted to you inviting you to vote a sum at the rate of £150 a year for the restoration of the Island Weather Service.

SYDNEY OLIVIER, *Governor.*

King's House, 27th June, 1907.

The service has been re-established at the modest expense of £150 per annum, and the U.S. Weather Bureau has presented the instruments belonging to them and arranged for the mutual exchange of storm warnings, for which in the hurricane season Jamaica is a most valuable centre.

ROYAL METEOROLOGICAL SOCIETY.

THE monthly meeting of this Society was held on Wednesday evening, December 13th, at the Institution of Civil Engineers, Great George Street, Westminster, Dr. H. R. Mill, President, in the chair.

Captain C. H. Ley read a paper on "The possibility of a Topography of the Air, based on Balloon observations with special Theodolites." The author gave the results of his own observations in Herefordshire, in connection with the International balloon ascents which were carried out during the past summer. His method of observing is based on the direct estimation of the range of the balloon from its apparent diameter, as measured by cross threads in a telescope; the range being thus determined, an altitude and azimuth are read, and the position of the balloon fixed and plotted on a map. As a rule, over a hill both the vertical and horizontal velocity increase, but the vertical velocity in greater proportion than the horizontal. On the other hand, over the lower ground, before and after a hill, it appears that a horizontal velocity usually increases faster, or shows a less decrease, than the vertical velocity, especially at the greater heights. The horizontal deflection of the wind, due to the ground, is much more marked when there is less wind, as in anticyclonic conditions, in cyclonic calms, and at low altitudes. In such conditions the general tendency seems to be for the breezes to blow as far as possible along the contours of the ground. In the case of a valley, the line of least resistance is found along the bottom of the valley; and in the case of a ridge this line is along the contours; and a breeze sometimes appears along and below the farther edge of the ridge, in a direction indicative of the general direction of the superimposed current. Horizontal deflection is often accompanied by a collapse of vertical velocity. The author, in conclusion, says the varying topography of the Earth's surface produces disturbances in the atmosphere with effects which are transmitted throughout the lower and middle strata; and that the general effect on a current is to increase its velocity over a hill and decrease it over a valley, and this is especially the case with the vertical velocity. The origin of the phenomena is to be sought in the mechanical effect of obstruction of the lowest stratum, but there are probably various ensuing complications which may accentuate the result. The measurement of these effects can be carried out by a topography of the air made in any locality.

Mr. W. W. Bryant, Mr. C. J. P. Cave, Capt. A. Carpenter, Dr. W. N. Shaw, Mr. E. S. Bruce, Mr. W. Marriott, and the President, took part in the discussion, and Capt. Ley replied.

Mr. R. Strachan also read a paper on "Indications of approaching frost," in which he said that for the purpose of making forecasts the dry and wet bulb thermometers should be noted at or after sunset, or at 9 p.m., and the amount of cloud at the time, and during the forepart of the night, if convenient. The dew-point can be found by reference to hygrometrical tables. When the dew point is at or below 32° frost is in evidence, but may be evanescent, due to a rise of temperature, with a change of wind, rain, or overcast sky. Even when it is above 32°, if the sky is clear it is possible that the temperature on the ground will go low enough for frost to

form. Thus the evening observations should lead to a good idea of what may happen during the night.

The following ladies and gentlemen were elected Fellows of the Society :—Mr. C. A. Allen, Mr. E. Heron Allen, Mr. A. Bailey, Mr. H. J. Bailey, Major W. Alcock Beck, Mr. C. H. Berners, Mr. C. Brown, Miss L. H. Bushell, Mr. C. P. Chambers, Mr. H. R. G. Clarke, Mr. A. Clay, Mr. H. B. Devereux, Mr. T. A. Dickson, Mr. J. Dixon, Mr. J. W. Duncan, Rev. J. C. Fox, Mr. E. Pirie Gordon, Mr. W. Hall, Mrs. Marcus Hare, Mr. J. Hawksley, Assoc. M.Inst. C.E., Mr. A. P. Jenkin, Mr. C. E. Jones, Assoc. M.Inst. C.E., Mr. Owen Jones, Mr. F. D. Kapadia, Mr. L. G. King, Miss I. J. R. Macadam, Mr. W. G. Machin, Mr. P. P. Pennant, Mr. J. E. Petavel, F.R.S., Miss F. Sparks, Mr. A. J. Stephens, Mr. W. S. Strachan, B. Sc., Capt. F. S. Symons, Mr. A. J. Walker, M.A., Mrs. M. Wilkin, Miss E. D. Woodhouse, and Miss J. L. Woodward.

THE CHRISTMAS SNOWSTORM OF 1906 IN EASTERN EUROPE.

"DAS WETTER" for February, 1907, contains a short article by Herr E. G. Edler with reference to snowfall and other meteorological conditions in Bohemia during the last week of 1906. During the night of December 26th snow fell at Wahlburg to the depth of six inches, accompanied by high wind, causing deep drifts. The snowstorm accompanied a barometrie pressure of 28·9 inches, unusually low for Central Europe.

On the 30th more snow fell, and during the ensuing night the temperature fell to 8° F., the sky being clear and the wind south-west, of Beaufort force 3. The storm of the 26th night was due to a small depression with steep pressure gradients over Bohemia, in some way subsidiary to a large and deep one centred over Scandinavia. It is quite likely that this small depression was identical with the deep one which moved south-eastwards across England on the night of December 25th, bringing with it so much deep snow. The enormous quantities of snow that fell in the east of Scotland between the 26th and 27th appear to have been occasioned by small secondary disturbances in connection with the large cyclonic system centred over Scandinavia. It may be noted, as a matter of interest, that Bohemia lies practically within the East-European region of perpetual winter snow, not like England in the West-European region of intermittently snow-covered ground. L. C. W. B.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

THE GREEN FLASH.

My residence at Montego Bay, Jamaica, faced the west, and at an elevation of 160 feet above sea-level it overlooked the bay. The sea horizon was as a rule wonderfully clear and well defined, so much so that stars of the first magnitude, with the aid of a field glass, could be seen to set, or rather to disappear instantly as in occultation.

After the spring equinox last year the sun could be seen to set below the sea horizon, and all the members of my family began to look out for the green flash. The first attempt was a failure; the bright red limb of the setting sun was so strong that we all saw green wherever else we looked, and our sight was dimmed at the critical moment.

Next evening we each had a card in which a pin-hole had been made, and what we saw that evening we could always see again during the three weeks the observations were continued.

Looking through the pin-hole, as the limb of the sun was about to disappear, it was seen to form a short, thin red line; suddenly this line was transformed into a bright red star, which remained red for about three seconds; then the colour suddenly changed from red to green, and remained so for about half a second, when it suddenly vanished.

Children and all saw the change of colour at the same instant of time; the cry of "There!" was simultaneous.

I was not able to go on with magnifying power and dark glasses simply because I was transferred from Montego Bay to Chapelton; and it appears that it would have been quite unnecessary, as Dr. Rambaut has done all that is required.

The effect is certainly due to the dispersion of the atmosphere, as Dr. Rambaut has explained in these pages last year; and my trivial device may be a source of amusement to many who have a clear sea horizon to the west.

MAXWELL HALL,

Jamaica, Dec. 11th, 1907. *Govt. Meteorologist.*

NOTES ON 1907.

The wettest day in each of the twelve months of 1907 occurred at Upton as follows:—

1st, 1st, 2nd, 2nd.....	of month.
11th, 11th, 12th, 12th, 14th.....	,,
21st	,,
25th, 26th	,,

(but not in the *sequence* given above). It will be noticed that on

four occasions the 1st—2nd of month occur, and on *five* occasions the 11th—14th.

Another feature of 1907 may be noted, the equability of temperature during the year. The highest was 78½° F. and the lowest was 21¼° in the screen. Days over 80° F. in the nine previous years (here) were, beginning with 1898: 19, 31, 23, 19, 9, 6, 14, 14, 21. Next comes the year 1907, *nil.*

The extraordinary mildness of December last will doubtless be referred to by other contributors.

RICHARD BENTLEY.

Upton, Slough, Bucks.

WANTED! A NAME.

In regard to "A.B.M.'s" letter I need hardly say that it is extremely difficult to change a name grown familiar by long usage. It is also, in some respects, inexpedient, though the name may not be appropriately expressive. I am afraid that however desirable it may seem, "meteorology" will long continue to represent the "science of the weather."

Even if a suitable substitute were found its general acceptance could not be ensured, and it would probably soon be dropped to revert to the older designation. In any case to alter a long-standing appellation would obviously cause confusion, besides bringing about more trouble and misunderstanding than the change was intended to avoid.

Various misnomers or badly-applied names could be quoted in several departments of science or as given to phenomena which they do not correctly express or imply. Thus in astronomy an "eclipse of the sun" is properly an "occultation of the sun," as the word eclipse is usually applied to an event where one celestial body is obscured by passing through the shadow of another, or during a lunar eclipse when the moon travels through the Earth's shadow. But there is little likelihood that the term "eclipse of the sun" will ever be put aside for one considered more applicable, for the ancient title is well understood if it is not accurate in a technical sense.

I am not an advocate for the retention in perpetuity of any inapt titles or misnomers where substantial reason can be assigned for change, but I think that in general it is best to preserve old names, for

"Time doth consecrate,
And what is grey with age becomes religion."

W. F. DENNING.

"SHADE" TEMPERATURE.

I recently had occasion to make a comparison of the maximum and minimum temperatures registered in (A) a verandah facing north, and (B) a Stevenson screen. The thermometers were by the best

makers, with Kew certificates, and were carefully compared by being hung side by side in the verandah on a wooden trellis five inches distant from the wall. The maxima were recorded continuously from September 15th to October 6th, and gave the means:

A .. ... 63°·6 B ..... 65°·7

The greatest differences were on

Sept. 24th ..... A ..... 65°·2 B ..... 69°·4
,, 25th ..... A ..... 70°·0 B ..... 74°·0

On one occasion only was A higher than B, viz., September 29th, when A was 60°·5 and B 60°·2.

The minima from September 19th to October 8th gave means:

A ..... 51°·7 B ..... 50°·7

The greatest difference was on October 5th:

A ..... 44°·0 B ..... 42°·1

B was never as high as A.

To summarize: the temperature in a verandah facing north and shielded from lateral sunshine is about 2° lower in the daytime and 1° higher at night. The latter is perhaps due to radiation from the wall of the house.

ALFRED O. WALKER.

Ulcombe Place, nr. Maidstone, Dec. 22nd, 1907.

THE GREENWICH OBSERVATIONS.

A CORRESPONDENT points out that the notice of the last annual report of the meteorological work at the Royal Observatory at Greenwich, on p. 219, contained some expressions that might give rise to misconceptions in the minds of some readers, and, while experience has convinced us that no form of words can be devised which can altogether exclude the possibility of misconception, we are always ready to try to correct any wrong ideas that may be suggested, however unwittingly, by anything which appears in these pages.

Our correspondent says that the reference to the different hours of observations on Sundays seems to him to give the impression that the Sunday results are less reliable than those of other days, which he says is not the case. The daily results for all days, as regards pressure and wet and dry bulb temperatures, are based on 24 hourly measurements of the photographic trace of the recording instruments, the eye observations being used simply to reduce the photographic records to the values of the standard instruments. The maximum and minimum temperatures are given for all days, Sundays included; and the omission of the Sunday observations at certain hours of the day in the case of the subsidiary thermometers in various positions is no great loss, as the weekday observations suffice to show the sort of variation that exists in the daily differences.

We understand that a deep-rimmed rain gauge, of the Meteor-

ological Office pattern, is being added to the existing rain gauges at the Royal Observatory for comparison with them

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We find on reference to the volume of Hourly Observations at the Observatories under the Meteorological Office, noticed on p. 219, that we, and not the Stationery Office, made a mistake, as there are 12 monthly parts at 6d. for each of the four Observatories, and not merely 12 monthly parts as we had rashly assumed.

REVIEWS.

Air Currents and the Laws of Ventilation. Lectures on the Physics of the Ventilation of Buildings, delivered in the University of Cambridge, in the Lent Term, 1903. By W. N. SHAW, Sc.D., F.R.S., Honorary Fellow of Emmanuel College; Director of the Meteorological Office Cambridge, at the University Press, 1907. Size $8\frac{1}{2} \times 5\frac{1}{2}$. Pp. xii.+94.

THIS little book abounds in novelty of presentation, the most striking instance being the way in which the author works out the theory of ventilation on the analogy of electricity, and so assigns quantitative values to the movement of air in buildings with relation to the size of orifices and the strength of currents. The book is thus of great scientific and practical interest. Dr. Shaw says that it is, in a way, his last will and testament in respect of ventilation, for "the requirements of the study of the processes of ventilation on the larger scale, as they are exhibited in the weather, no longer permit me to work out these interesting, but complicated problems."

Handbuch der Ozeanographie von DR. OTTO KRÜMMEL. *Band I. Die räumlichen, chemischen und physikalischen Verhältnisse des Meeres.* [Handbook of Oceanography by Dr. Otto Krümmel. Vol. I. The dimensional, chemical and physical conditions of the Sea.] Stuttgart: Engelhorn, 1907. Size 9 × 6. Pp. xvi. + 526. Price 22 marks.

PROFESSOR KRÜMMEL, who fills the Chair of Geography in the University of Kiel, and has been for many years the leading German exponent of oceanography, has produced what is nominally a new edition of the first volume of the Handbook of Oceanography, written some years ago by Professor G. von Boguslawski and himself, but really it is a new work, entirely re-written and based upon the accumulated records of oceanographical research down to the latest date. While the whole question of the physics of the ocean lies close to that of the physics of the atmosphere, and no part of the science of the sea can be held alien by the student of the air, the part of this book which most directly concerns us in this place is

the short section on the relations between air and water temperature, a matter to which Professor Krümmel has given particular attention. He shows that the surface of the sea is in general warmer than the overlying air, and to such an extent is this the case in winter, that the warm Atlantic water entering the Baltic on a cold day often steams so strongly that the columns of condensed vapour resemble waterspouts, and give rise to showers of powdery snow. Over cold currents, however, the air may remain warmer than the water for many months together. Professor Krümmel deals with the whole of his wide subject with a firm hand, and in an interesting style.

Note on the Connection between Rainfall at Durban and Mauritius. By T. F. CLAXTON, F.R.A.S. Reprint from *Trans.* South African Philosophical Society, Vol. **16**, Pt. 5. June, 1907. Size, 10 × 6½. Pp. 6.

MR. T. F. CLAXTON, as the first results of an inquiry into the possibility of drawing up seasonal weather forecasts for the island of Mauritius, shows by a comparison of observations made at Durban with those at ten stations scattered over the island of Mauritius during the years 1873–1904, that winter droughts at Durban have invariably been followed by summer droughts in Mauritius; also that prolonged droughts in Natal, or those commencing in summer, have been either accompanied or followed by prolonged droughts in Mauritius. The interval between the winter droughts at Durban and the summer droughts at Mauritius is from three to seven months, and appears to depend on the time of commencement of the former. No relation, however, is apparent between the interval, duration and intensity of the Mauritius summer droughts with the duration and intensity of the Natal winter ones. Mr. Claxton regrets that he was unable to avail himself of observations from other places in Natal besides Durban. A point of interest noted by him, is that the Durban winter droughts are not necessarily followed by an absence in summer of cyclones in the neighbourhood of Mauritius, and that the summer droughts of Mauritius are related to the non-cyclonic type of rainfall. L.C.W.B.

The Science Year Book and Diary for 1908. (Fourth year of issue.) Edited by MAJOR B. F. S. BADEN-POWELL. London: King, Sell and Olding. Size, 9 × 5.

THIS convenient and useful combination of book of reference and diary continues to improve with each successive issue. The Editor asks for suggestions for further improvement, and we agree with his own suggestion in the preface, that more detailed summaries of the scientific progress of the previous year would be a welcome addition.

Report of Committee appointed to enquire whether earlier warning of the Typhoon of September 18th, 1906, could have been given to shipping, Hongkong, 1906. Size, $13\frac{1}{2} \times 9$. Pp. 60.

REFERENCE was made to the appointment of this Committee in the Magazine for October, 1906 (Vol. **41**, p. 171), and we are happy now to give the substance of the report as submitted to Sir Matthew Nathan, Governor of Hongkong, by the Committee consisting of Sir Henry S. Berkeley, K.C., Lieut. H. Butterworth, R.N., Mr. A. B. Skottowe of the Eastern Extension Telegraph Company, and Captain A. Sommerville.

The Committee met on the 24th of September, 1906, as well as on several subsequent occasions; although not invested with power to compel the attendance of witnesses, it invited ship-masters and others likely to possess information to assist in the enquiry. The evidence taken by the Committee is appended to the report. The Shanghai Observatory on the 18th, after the storm published the following:—"A very violent storm of quite limited area raged in Hongkong on Tuesday morning" (18th). At 8 a.m. on the 18th an order to hoist the Black Drum was issued from the Hongkong Observatory, indicating the existence of a typhoon at a distance within 300 miles from the colony. The Committee were of opinion that the barometric observations noted in the report did not call for the hoisting of any typhoon signal in Hongkong on the 17th of September. Evidence as to the general appearance of the weather on the morning of the 18th, prior to the hoisting of the Black Drum, was conflicting. Summing up the whole evidence, the Committee found that before 7.44 a.m. on the 18th there were no signs of the approach to Hongkong of a typhoon; and that warning, by the hoisting of the Black Drum, was given as soon as was practically possible.

From the evidence annexed to the report, it appears that the area of the storm was small. Thus, while at 10 a.m. the storm at Hongkong had reached its greatest fury with a south-west wind of force 11, at Macao, about 36 miles away, the wind was north of force 1. Captain Hooker, of the China Navigation Company's s.s. "Kwei Chow," recorded by his typhoon barometer a decrease of pressure out at sea amounting to an inch in an hour and a half.

The pressure chart for 6 a.m., September 18th, 1906, issued by the Zi-Ka-Wei Observatory of the China Weather Service, shows that an anticyclonic area lay to the north of China, and that a low-pressure area favourable for typhoon development embraced the neighbourhood of Hongkong.

The typhoon, it will be remembered, was a disastrous one, and the following meteorological observations recorded at Hongkong Observatory while it was raging on the morning of the 18th may be of interest:—

Hours.	Barometer reduced to sea level.	Temp.	Wind.		Clouds.
			Direction.	Force.	
7 a.m...	29·698 in.	77°·3 F.	N.W.	3	10 nimbus N.N.W.
8 ,, ...	·604 ,,	76°·8 ,,	N.W.	5	—
9 ,, ...	·394 ,,	—	W. by N.	10	—
10 ,, ...	·275 ,,	75°·0 ,,	S.W.	10–11	10 nimbus.
11 ,, ...	·633 ,,	—	S.	6	—
12 ,, ...	·703 ,,	77°·1 ,,	S.S.W.	4–7	10 nimbus S.S.W.
1 p.m...	·767 ,,	78°·5 ,,	S.	3	—

L. C. W. B.

Discussion of the Errors of certain types of Minimum Spirit Thermometers in use at the Royal Alfred Observatory, Mauritius. By B. A. WALTER, F.R.A.S., Chief Assistant. From *Trans.* S. African Phil. Soc., **16** (1907), Part 5). Size, 10 × 6½. Pp. 18.

DESCRIPTION of an elaborate series of experiments devised to account for the discrepancies observed between the minimum as recorded by a photographic thermograph and an ordinary minimum thermometer. The practical conclusion arrived at by Mr. Walter is that no spirit thermometer with a spherical bulb should be allowed in the equipment of a meteorological observatory, as by reason of their sluggishness such thermometers always give too high a minimum, sometimes by as much as 3° F. We entirely concur in this conclusion; our own observations with different patterns of spirit thermometers leading us to view the spherical-bulb instrument as practically useless, at least as a minimum on grass.

Report of the Chief of the Weather Bureau for 1907, by WILLIS L. MOORE, *U.S. Department of Agriculture.* Washington, 1907. Size, 9 × 6. Pp. 56.

AN official report commencing "Americans take pride," shows that the work being reported on is going forward with confidence and a light heart. They take pride, it goes on to say, "in the pioneer work that Lieutenant Maury, the naval meteorologist, did," and that pioneer work is being continued with an energy and enthusiasm that are altogether admirable. American meteorologists are proud of their past, and not so much hopeful as certain of their future. What European official would write in such a strain as follows?

"A research observatory has been created at Mount Weather, Va., and a staff of highly trained and ambitious young men has been

formed. The first important result achieved by this staff was the sending of meteorological instruments by means of aeroplanes to greater altitudes than has to our knowledge been accomplished elsewhere. The observations thus obtained have been continued for over three months in succession, practically without interruption, and it is probable that such record will be maintained indefinitely in the future."

On October 3rd, 1907, observations were made by means of aeroplane at 23,111 feet above sea level, and "the world's record for the securing of observations high in the air was broken." Free balloons with meteorographs are to be used in large numbers for the purpose of exploring the atmosphere up to 10 miles, and a strong effort is being made to apply upper air results in forecasting weather.

All the other departments of the work, special investigations of evaporation of the Salton Lake, radiation experiments, wireless telegraphy, teaching of meteorology and the like, are dealt with in the same spirit, and this healthy and optimistic report winds up with "Increase in Salaries."

Ceylon. Administration Reports, 1906. *Part IV. Education, Science and Art; Meteorology. Report of the Surveyor-General.* Size 13 × 8. Pp. 52. Plates.

A FULL account of the meteorological observations in Ceylon during 1906, illustrated by diagrams, rainfall maps of the months and of the year, the latter indicating the direction and force of the wind, and with an interesting plate showing tea-leaves bruised and perforated by hail.

METEOROLOGICAL NEWS AND NOTES.

THE PORTRAIT OF DR. ALEXANDER BUCHAN which, by the kindness of Mr. John Thomson, we are enabled to reproduce as a frontispiece to this volume, is a very faithful presentment of the striking personality of the distinguished meteorologist, a sketch of whose career will be found on pp. 103–106.

DR. H. R. MILL is to give a course of six lectures on the Geographical Distribution of Rainfall in the British Isles, under the auspices of the Royal Geographical Society, at the Theatre, Burlington Gardens, on Thursdays, at 6 p.m., commencing on January 23rd and continuing weekly. Full particulars may be obtained on application to the Chief Clerk, Royal Geographical Society, 1, Savile Row, London, W.

MR. GOLD, THE LECTURER ON METEOROLOGY in the University of Cambridge, begins a course of eight lectures in the Cavendish Laboratory on January 16th. Lectures I. to IV. will deal with the Thermo-dynamics of the Atmosphere, and Lectures V. to VIII. with

Atmospheric Motion. The syllabus of the course promises well for original handling of data which have not yet become the commonplaces of text-books.

THE STUDY OF WEATHER AS A BRANCH OF NATURE KNOWLEDGE is treated in an admirable article by Miss Marion Newbigin, D.Sc., in the *Scottish Geographical Magazine* for December, 1907, being a lecture which she had delivered to teachers in Aberdeen and in Edinburgh. She strongly commends meteorology as a branch of Nature study in schools.

AVAILABLE DAYLIGHT may be measured by the number of hours between sunrise and sunset during which we are awake and about. The proverbial healthiness and wisdom of "early to bed and early to rise" depend on the increase of the available daylight, and an ingenious plan to enable everyone to find these boons unconsciously has been put forward by Mr. Wm. Willett. It consists in a compulsory putting back of all official clocks, so as to make the nominal day begin earlier in the summer months, so that the world will go to work soon after sunrise and leave a large surplus of daylight for enjoyment after work hours. The suggestion is admirable, and would work perfectly under an ideal despotism; but, except at sea, where it is the order of the day in order to keep the meridians straight, we fear the inherent conservatism of the British people would never sanction so revolutionary a proceeding. From the point of view of scientific work, of course the displacement of 12 o'clock from mean noon could not be contemplated, but if a neatly-phrased alternative system of time-keeping could be arrived at we should greatly enjoy the 210 extra hours of sunshine, or at least of daylight, in the waking year.

THE INTERIOR OF THE EARTH MAY INFLUENCE CLIMATE in the opinion of Prof. John Milne, who in his report on Seismology to the Leicester meeting of the British Association, pointed out that there was evidence in the luminous appearance sometimes seen on cliffs or quarry walls of radio-active or electric emanations from the solid substance of the Earth, and, if such exist, it is very unlikely that they do not affect the climate. At present the supposed effect is purely hypothetical, and there is no foundation for the positive statements in some newspapers that weather is made in the Earth's crust.

Erratum.—Our attention has been called to a stupid blunder in the heading of the Climatological Table for the British Empire, on the last page of each number of this Magazine, from April to October, 1907, where the column of "Absolute" extremes refers to "Max. on grass," in place of "Min. on grass." The obviousness of the blunder makes it the less harmful, but how it should have been passed so long in proof-reading is one of the problems that puzzle an Editor.

TEMPERATURE FOR DECEMBER, 1907.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	TEMPERATURE. Max.		TEMPERATURE. Min.		No. of Nights at or below 32° Shade.	No. of Nights at or below 32° Grass.
		° ′	° ′		°	Date.	°	Date.		
Camden Square	*London*	51 32	0 8	111	57·0	8	29·9	16	2	12
Tenterden	*Kent*	51 4	*0 41	190	58·0	8	30·0	16	7	15
West Dean	*Hampshire*	51 3	1 38	137	56·0	8	26·0	6	10	18
Hartley Wintney	,,	51 18	0 53	222	55·0	8, 9, 10	28·0	6, 7	10	19
Hitchin	*Hertfordshire*	51 57	0 17	238	56·0	8	28·0	15‖	...	13
Winslow (Addington)	*Buckinghamshr.*	51 58	0 53	309	54·0	8	28·0	30	13	17
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	55·0	8	26·0	24	16	...
Brundall	*Norfolk*	52 37	*1 26	66	56·4	8	26·2	16	8	22
Winterbourne Steepleton	*Dorset*	50 42	2 31	316	54·4	8	29·3	6	7	11
Torquay (Cary Green)	*Devon*	50 28	3 32	12	57·2	8	33·5	29	0	3
Polapit Tamar [Launceston]	,,	50 40	4 22	315	56·0	8	28·2	30	4	12
Bath	*Somerset*	51 23	2 21	67	57·0	8	29·0	6, 30	8	...
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	51·0	8	27·0	28, 29	10	...
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	52·5	8	24·0	29	15	...
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	47·0	19	31·0	28, 30	3	...
Boston	*Lincolnshire*	52 58	0 1	25	52·0	8	29·0	16	12	...
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	55·0	8	25·4	24	11	25
Derby (Midland Railway)	*Derbyshire*	52 55	1 28	156	54·0	8, 20	26·0	30	13	...
Bolton (Queen's Park)	*Lancashire*	53 35	2 28	390	51·7	8	29·6	1	9	19
Wetherby (Ribston Hall)	*Yorkshire, W.R.*	53 59	1 24	130	...	...	...	...	...	...
Arncliffe Vicarage	,, ,,	54 8	2 6	732	...	...	...	...	...	...
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	54·0	8	25·0	24	5	19
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	...	...	...	...	...	...
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	52·5	7	28·4	15	7	...
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	...	...	...	...	...	...
Haverfordwest (High Street)	*Pembroke*	51 48	4 58	95	54·5	9	26·7	29	7	10
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	54·0	20, 21	20·0	28	...	...
Llandudno	*Carnarvon*	53 20	3 50	72	55·0	4	32·2	27	0	...
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	52·0	19	24·0	1	10	...
Lilliesleaf (Riddell House)	*Roxburgh*	55 31	2 46	550	...	...	...	...	...	...
Edinburgh (Royal Observy.)	*Midlothian*	55 55	3 11	442	48·8	8, 22	30·1	30	7	15
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	50·0	7†	23·0	15	12	12
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	50·0	19	25·0	1	6	26
Tighnabruaich	*Argyll*	55 55	5 14	50	44·0	18	27·0	14	16	17
Mull (Quinish)	,,	56 36	6 13	35	52·0	13	...	...	...	...
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	47·5	17	26·0	1	9	...
Braemar	*Aberdeen*	57 0	3 24	1114	...	...	...	...	...	...
Aberdeen (Cranford)	,,	57 8	2 7	120	48·0	2‡	24·0	29	14	...
Cawdor	*Nairn*	57 31	3 57	250	...	...	...	...	...	...
Invergarry	*E. Inverness*	57 4	4 47	130?	...	...	...	...	...	...
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	...	...	...	...	...	...
Dunrobin Castle	*Sutherland*	57 59	3 56	14	50·5	17	28·5	30	11	...
Castletown	*Caithness*	58 35	3 23	100	50·0	17	27·0	8§	22	24
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	56·0	8	29·5	29	...	...
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	53·0	16	27·0	6	7	...
Broadford (Hurdlestown)	*Clare*	52 48	8 38	167	48·0	16, 19	28·0	6¶	13	...
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	53·0	19	23·0	5**	...	13
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	54·8	20	31·0	15	1	9
Ballinasloe	*Galway*	53 20	8 15	160	53·0	7	23·0	24	21	...
Clifden (Kylemore House)	,,	53 32	9 52	105	...	...	...	...	...	...
Crossmolina (Enniscoe)	*Mayo*	54 4	9 18	74	...	...	...	...	...	...
Seaforde	*Down*	54 19	5 50	180	52·0	7	28·0	6††	10	16
Londonderry (Creggan Res.)	*Londonderry*	54 59	7 19	320	...	...	...	...	...	...
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	...	...	...	...	...	...

† and 19, 20. ‡ and 17, 22. ‖ and 23, 24. § and 30, 31. ¶ and 28, 31. ** and 22, 28. †† and 14, 24.

RAINFALL FOR DECEMBER, 1907.

RAINFALL OF MONTH.							RAINFALL FROM JAN. 1.					
Aver. 1870-99.	1907.	Diff. from Av.	% of Av.	Max. in 24 hours.		No. of Days	Aver. 1870-99.	1907.	Diff. from Aver.	% of Av.	Mean Annual 1870-1899.	STATION.
in.	in.	in.		in.	Date.		in.	in.	in.		in.	
2·12	3·79	+1·67	178	·72	12	16	25·16	23·01	— 2·15	91	25·16	Camden Square
2·74	2·78	+ ·04	101	·47	13	16	28·36	24·86	— 3·50	88	28·36	Tenterden
2·74	4·32	+1·58	158	·95	2	20	29·93	29·28	— ·65	98	29·93	West Dean
2·55	3·68	+1·13	144	·70	11	17	27·10	27·46	+ ·36	101	27·10	HartleyWintney
2·05	3·26	+1·21	159	·85	4	14	24·66	24·51	— ·15	99	24·66	Hitchin
2·27	3·79	+1·52	167	·79	4	21	26·75	25·54	— 1·21	95	26·75	Addington
2·11	3·05	+ ·94	144	·64	13	16	25·39	24·78	— ·61	98	25·39	Westley
2·13	2·60	+ ·47	122	·64	13	20	25·40	25·41	+ ·01	100	25·40	Brundall
4·13	5·53	+1·40	134	·82	11	26	39·00	39·27	+ ·27	101	39·00	Winterbourne Stpltn
3·46	4·37	+ ·91	126	·65	2	28	35·00	33·22	— 1·78	95	35·00	Torquay
4·39	6·48	+2·09	148	1·33	4	25	38·85	38·14	— ·71	98	38·85	Polapit Tamar
2·76	4·80	+2·04	174	1·04	4	21	30·75	32·33	+ 1·58	105	30·75	Bath
2·48	5·01	+2·53	202	·90	4	17	29·85	31·60	+ 1·75	106	29·85	Stroud
2·92	3·83	+ ·91	131	·68	4	21	33·04	36·00	+ 2·96	109	33·04	Wolstaston
2·44	3·36	+ ·92	138	·64	4	15	29·21	29·28	+ ·07	100	29·21	Coventry
1·79	2·41	+ ·62	135	·66	4	16	23·30	22·36	— ·94	96	23·30	Boston
2·02	2·37	+ ·35	117	·90	12	19	24·70	23·66	— 1·04	96	24·70	Hodsock Priory
2·28	2·85	+ ·57	125	·52	13	22	26·18	28·38	+ 2·20	108	26·18	Derby
4·19	4·59	+ ·40	110	·61	7	22	42·43	45·56	+ 3·13	107	42·43	Bolton
2·19	2·76	+ ·57	126	·60	7	18	26·96	29·44	+ 2·48	109	26·96	Ribston Hall
6·41	8·99	+2·58	140	1·24	19	24	60·96	63·30	+ 2·34	104	60·96	Arncliffe Vic.
2·36	2·55	+ ·19	108	·48	13	23	27·02	24·82	— 2·20	92	27·02	Hull
2·64	3·06	+ ·42	116	·57	13	24	27·99	27·33	— ·66	98	27·99	Newcastle
14·70	19·13	+4·43	130	2·85	13	20	132·68	128·81	— 3·87	97	132·68	Seathwaite
4·43	7·54	+3·11	170	1·33	4	24	42·81	42·32	— ·49	99	42·81	Cardiff
5·22	4·26	— ·96	82	·65	7	22	47·88	44·17	— 3·71	92	47·88	Haverfordwest
4·49	4·59	+ ·10	102	·56	7†	21	45·41	47·05	+ 1·64	104	45·41	Gogerddan
2·95	2·14	— ·81	73	·43	9	18	30·98	26·31	— 4·67	85	30·98	Llandudno
4·68	5·53	+ ·85	118	1·22	19	14	43·43	49·29	+ 5·86	114	43·43	Cargen
3·18	...	...	...	...	...	...	33·04	...	...	...	33·04	Riddell House
...	3·77	...	...	1·18	13	17	...	30·19	...	...	...	Edinburgh
5·24	5·49	+ ·25	105	·68	7	23	48·87	57·67	+ 8·80	118	48·87	Girvan
3·53	5·58	+2·05	158	·78	20	20	35·80	42·23	+ 6·43	118	35·80	Glasgow
6·33	7·51	+1·18	119	1·03	7	22	57·90	64·37	+ 6·47	111	57·90	Tighnabruaich
6·48	7·02	+ ·54	108	·93	4	20	57·53	55·06	— 2·47	96	57·53	Quinish
2·73	3·55	+ ·82	130	·95	13	26	28·95	31·40	+ 2·45	108	28·95	Dundee
3·15	2·56	— ·59	81	...	...	...	36·07	31·53	— 4·54	87	36·07	Braemar
3·39	3·77	+ ·38	111	1·07	13	18	33·01	32·87	— ·14	100	33·01	Aberdeen
2·53	1·65	— ·88	65	·46	13	8	29·37	30·54	+ 1·17	104	29·37	Cawdor
6·67	8·66	+1·99	130	1·25	9	19	56·00	61·29	+ 5·29	109	56·00	Invergarry
9·04	9·30	+ ·26	103	1·38	4	22	86·50	91·11	+ 4·61	105	86·50	Bendamph
3·39	2·81	— ·58	83	·78	13	14	31·60	32·17	+ ·57	102	31·60	Dunrobin Castle
...	3·03	...	...	·60	13	26	...	31·20	...	...	...	Castletown
6·64	8·31	+1·67	125	·91	3	28	58·11	46·98	—11·13	81	58·11	Killarney
4·31	5·38	+1·07	125	·71	19	25	39·30	39·89	+ ·59	102	39·30	Waterford
3·37	4·42	+1·05	131	·50	19	28	33·47	37·47	+ 4·00	112	33·47	Hurdlestown
3·48	4·07	+ ·59	117	·68	19	26	35·19	38·03	+ 2·84	108	35·19	Abbey Leix
2·39	2·15	— ·24	90	·49	19	22	27·75	26·99	— ·76	97	27·75	Dublin
3·63	4·22	+ ·59	116	1·01	19	25	37·04	37·24	+ ·20	101	37·04	Ballinasloe
8·99	11·01	+2·02	122	·90	17	24	80·23	74·51	— 5·72	93	80·23	KylemoreHouse
5·81	7·94	+2·13	137	1·30	17	28	50·50	53·81	+ 3·31	107	50·50	Enniscoe
3·64	3·71	+ ·07	102	·65	7	23	38·61	39·93	+ 1·32	103	38·61	Seaforde
4·31	4·30	— ·01	100	·63	10	23	41·20	47·16	+ 5·96	114	41·20	Londonderry
3·77	...	...	...	...	...	...	37·85	...	...	...	37·85	Omagh

† and 10, 13.

SUPPLEMENTARY RAINFALL, DECEMBER, 1907.

Div.	STATION.	Rain inches	Div.	STATION.	Rain. inches
II.	Abinger Hall	4·49	XI.	Rhayader, Tyrmynydd	6·55
,,	Ramsgate	1·60	,,	Lake Vyrnwy	7·89
,,	Hailsham	3·44	,,	Llangyhanfal, Plâs Draw....	2·19
,,	Crowborough, Uckfield Lodge	4·42	,,	Criccieth, Talarvor	3·33
,,	Totland Bay, Aston House.	3·02	,,	Llanberis, Pen-y-pass	...
,,	Emsworth, Redlands	3·37	,,	Lligwy	3·14
,,	Alton, Ashdell	4·65	,,	Douglas, Woodville	5·35
,,	Newbury, Welford Park ...	5·93	XII.	Stoneykirk, Ardwell House	4·28
III.	Harrow Weald, Hill House.	3·34	,,	Dalry, The Old Garroch ...	7·66
,,	Oxford, Magdalen College..	3·74	,,	Langholm, Drove Road	7·03
,,	Bloxham Grove	3·74	,,	Moniaive, Maxwelton House	6·19
,,	Pitsford, Sedgebrook	3·60	XIII.	N. Esk Reservoir [Penicuick]	3·50
,,	Huntingdon, Brampton	3·28	XIV.	Maybole, Knockdon Farm..	4·48
,,	Wisbech, Bank House	2·73	XV.	Campbeltown, Witchburn...	5·57
IV.	Southend Water Works	2·44	,,	Inveraray, Newtown	8·72
,,	Colchester, Lexden	2·48	,,	Ballachulish House	11·29
,,	Newport, The Vicarage	3·00	,,	Islay, Eallabus	6·08
,,	Rendlesham	2·64	XVI.	Dollar Academy	6·58
,,	Swaffham	2·53	,,	Loch Leven Sluice	4·64
,,	Blakeney	2·84	,,	Balquhidder, Stronvar	9·06
V.	Bishops Cannings	4·16	,,	Perth, Pitcullen House	4·29
,,	Ashburton, Druid House ...	7·94	,,	Coupar Angus Station	3·72
,,	Okehampton, Oaklands	7·70	,,	Blair Atholl	3·26
,,	Hartland Abbey	5·37	,,	Montrose, Sunnyside Asylum	3·47
,,	Lynmouth, Rock House ...	7·51	XVII.	Alford, Lynturk Manse ...	3·63
,,	Probus, Lamellyn	4·90	,,	Keith Station	1·98
,,	Wellington, The Avenue ...	...	XVIII.	N. Uist, Lochmaddy	...
,,	North Cadbury Rectory ..	4·71	,,	Alvey Manse	1·84
VI.	Clifton, Pembroke Road ...	6·28	,,	Loch Ness, Drumnadrochit.	2·93
,,	Ross, The Graig	3·71	,,	Glencarron Lodge	8·52
,,	Shifnal, Hatton Grange	2·42	,,	Fearn, Lower Pitkerrie	2·34
,,	Cheadle, The Heath House.	...	XIX.	Invershin	3·58
,,	Blockley, Upton Wold	4·07	,,	Altnaharra	3·16
,,	Worcester, Boughton Park.	3·81	,,	Bettyhill	2·40
VII.	Market Overton	3·22	XX.	Dunmanway, The Rectory..	11·80
,,	Market Rasen	2·16	,,	Cork	7·02
,,	Bawtry, Hesley Hall	2·30	,,	Darrynane Abbey	9·03
VIII.	Neston, Hinderton Lodge...	1·76	,,	Glenam [Clonmel]	7·42
,,	Southport, Hesketh Park...	3·43	,,	Ballingarry, Gurteen	3·65
,,	Chatburn, Middlewood	5·88	,,	Miltown Malbay	5·07
,,	Cartmel, Flookburgh	5·99	XXI.	Gorey, Courtown House ...	2·73
IX.	Langsett Moor, Up. Midhope	4·93	,,	Moynalty, Westland	3·92
,,	Scarborough, Scalby	3·85	,,	Athlone, Twyford	3·39
,,	Ingleby Greenhow	4·10	,,	Mullingar, Belvedere	3·28
,,	Mickleton	4·57	XXII.	Woodlawn	4·81
X.	Bardon Mill, Beltingham ...	3·91	,,	Westport, Murrisk Abbey..	...
,,	Ewesley, Fallowlees	3·86	,,	Collooney, Markree Obsy..	4·59
,,	Ilderton, Lilburn Cottage...	3·24	,,	Mohill	3·95
,,	Keswick, York Bank	8·68	XXIII.	Enniskillen, Portora	...
XI.	Llanfrechfa Grange	8·37	,,	Warrenpoint, Summer Hill.	2·87
,,	Treherbert, Tyn-y-waun ...	12·68	,,	Banbridge, Milltown	2·65
,,	Carmarthen, The Friary....	5·36	,,	Belfast, Springfield	4·28
,,	Castle Malgwyn [Llechryd].	4·43	,,	Bushmills, Dundarave	3·91
,,	Plynlimon	10·90	,,	Stewartstown, The Square..	3·47
,,	Crickhowell, Ffordlas	6·00	,,	Killybegs	7·59
,,	New Radnor, Ednol	6·05	,,	Horn Head	5·22

METEOROLOGICAL NOTES ON DECEMBER, 1907.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder: L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow.

LONDON, CAMDEN SQUARE.—The most prominent feature was the absence of low temp.; the mean temp. was 42°·0, or 2°·8 above the average, and the mean shade min. 37°·6, or 3°·2 above the average. Heavy R fell during the second week, but the latter half of the month was generally dry although extremely sunless. Total duration of sunshine 23·4* hours, of R 57·1 hours.

CROWBOROUGH.—R ·99 in. above the average. Comparatively mild till 23rd, with frequent gales during the first fortnight. The last 8 days were cold, with keen E. and N.E. winds. Mean temp. 40°·1, or 1°·1 above the average.

WEST DEAN.—Mild and wet, with R double, and mean temp. nearly 3° above, the average. From 24th to the end was dark and gloomy.

TORQUAY.—Mean temp. 45°·6, or 2°·0 above the average. Duration of sunshine 48·4* hours, or 5·2 below the average.

CLIFTON.—Except 1876 the wettest December in 52 years. Heavy R fell every day till 13th. The last week was dry and cold, with E. winds.

BOLTON.—Remarkably dull, only 3·2* hours of sunshine being registered, or 9·6 below the average; 26 sunless days. Temp. above the average for the first three weeks, after which the wind changed to E. and the temp. fell 10°. Mean temp. 39°·7, or 0°·7 above the average.

SOUTHPORT.—Mild and wet till 23rd; afterwards colder and very dry with E. wind. Mean temp. 40°·2, or 0°·6 above the average. Duration of sunshine 35* hours, or 3 above the average. R ·45 in. above the average; duration 48·3 hours.

HULL.—Almost sunless, the total duration being only 3* hours. Frequent R and mist. Dense fog on 18th, 23rd and 24th.

HAVERFORDWEST.—A stormy month, mild till 22nd, after which frost was much needed to check vegetation. Duration of sunshine 36·6* hours.

DOUGLAS.—An almost unbroken period of heavy R or gales to 23rd, the land being full of water. Afterwards violent E. gales causing great dislocation of the cross-channel mail services; these still showed no signs of abating at the end when the weather was extremely cold.

COUPAR ANGUS.—The most persistently wet month of the year. Mean temp. 35°·8, being normal.

ABERDEEN.—Dull and wet with little frost, and no S. Wind, chiefly W., S.W., and S.

DRUMNADROCHIT.—R 1·18 in. below, and rain days 1 above, the average of 21 years. R fell on each of the first 23 days, but the last 8 were dry and frosty. There was no S.

CASTLETOWN.—Fresh and open throughout. There was practically no S.

CORK.—R 2·57 in. above the average. Prevailing winds S.W. and E.; gales from N.W. on 13th, and from S.E. on 25th and 26th. Dense fog on 23rd. S on 2nd.

DARRYNANE.—R 63 per cent. above the average of 28 years, and the heaviest for December in that period. On the whole it was mild, but the last 5 days were very cold.

MILTOWN MALBAY.—Miserably cold and wet ending with a blizzard on 27th.

DUBLIN.—Cloudy and dull, with frequent but not excessive precipitation. Very mild from 16th to 22nd, followed by strong S.E. and E. winds, and bitterly cold in last week. Mean temp. 43°·0, or 1° above the average.

KYLEMORE.—Remarkable for much S and sleet, with a considerable amount of black frost towards the end, with strong E. winds.

MARKREE OBSERVATORY.—R fell continually till 26th, with frequent H, sleet and gales at times. S on 30th and 31st. Temp. about the average, but bright sunshine deficient.

* Campbell-Stokes.

Climatological Table for the British Empire, July, 1907.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	78·1	19	42·3	11	70·0	51·3	52·2	77	122·9	39·9	1·96	15	7·0
Malta	...	...	...	...	...	...	...	...	...	...	...	...	...
Lagos	86·0	1	68·5	30	81·8	73·3	73·1	86	158·0	63·0	20·08	25	8·7
Cape Town	79·4	9	37·0	3	65·8	45·4	46·5	69	...	...	1·38	3	3·8
Durban, Natal ...	83·1	17	46·1	8	74·0	52·2	...	...	133·1	...	·16	5	1·8
Johannesburg	65·1	19	29·6	4	59·3	40·3	37·3	69	132·8	23·1	·00	0	0·8
Mauritius	77·0	5	54·8	22	73·5	60·9	58·2	73	135·9	46·0	·33	9	5·9
Calcutta...	92·1	19	74·6	8	89·5	79·4	78·3	85	154·9	72·7	8·16	16	8·6
Bombay...	89·1	10	73·5	24	84·8	78·0	76·9	86	134·1	71·8	59·26	26	8·5
Madras	100·8	14	75·0	9	96·0	78·7	73·6	69	143·5	72·8	2·80	11	5·9
Kodaikanal	67·2	11	49·7	30	62·7	52·7	51·9	85	136·8	43·1	3·90	26	7·6
Colombo, Ceylon ...	87·3	9	72·2	13	85·5	77·0	74·0	81	146·3	72·0	8·71	14	7·4
Hongkong	90·2	16	74·7	17	87·1	79·1	75·4	80	141·6	...	7·39	15	7·2
Melbourne	65·4	26	31·1	19	55·2	41·3	40·8	78	116·2	23·6	2·17	11	6·0
Adelaide	69·3	31	36·1	18	58·8	44·8	44·8	79	120·9	31·8	2·81	20	6·5
Coolgardie	75·5	17	34·4	10	62·1	42·9	41·9	66	139·9	27·5	1·07	11	5·4
Sydney	66·3	22	37·9	14	59·7	44·6	41·2	77	98·9	28·0	·37	14	3·4
Wellington ...	59·0	31	34·0	11	51·6	42·2	38·2	76	94·0	26·0	3·75	13	5·8
Auckland	61·0	2	39·0	10	55·9	46·4	46·0	83	112·0	35·0	6·33	19	6·4
Jamaica, Negril Point.	91·0	12	69·2	5	88·0	71·9	71·8	72	...	...	3·90	15	6·1
Trinidad	...	...	...	...	...	...	...	...	...	...	...	...	...
Grenada	85·0	16,26	70·0	20	83·0	73·5	71·2	80	141·2	...	10·73	26	5·5
Toronto	90·0	16	48·1	4	80·7	57·8	...	...	106·5	44·7	2·03	...	4·3
Fredericton	87·8	17	46·0	29	73·9	55·0	...	80	...	...	3·50	12	7·1
St. John's, N.B. ...	76·5	4	49·5	2	66·9	54·8	...	...	...	...	4·33	18	...
Victoria, B.C.	87·1	30	46·7	5	...	...	...	...	...	...	·39	2	3·0
Dawson	88·5	31	38·0	5	72·3	45·6	...	...	...	...	1·93	11	5·7

LAGOS.—3·63 in. of R fell on the 18th.

JOHANNESBURG.—Bright sunshine 308·12 hours.

Mauritius.—Mean temp. of air 0°·5, of dew point 1°·2, relative humidity 2·3 per cent., and R 1·91 in., below averages. Mean hourly velocity of wind 10·9 miles, or 1·1 mile below average.

MADRAS.—R 28 per cent. below. Bright sunshine 132·0 hours. TSS on 4 days.

KODAIKANAL.—Bright sunshine 101 hours.

COLOMBO.—Mean temp. of air 80°·5 or 0°·2 below, of dew point 0°·7 above, and R 4·09 in. above, averages. Mean hourly velocity of wind 8·1 miles. TS on 12th.

HONGKONG.—Mean temp. of air 82°·5. Bright sunshine 210·5 hours. Mean hourly velocity of wind 10·3 miles. R 5·94 in. below average.

Adelaide.—Mean temp. of air 0°·3 above, and R ·24 in. above, averages.

Sydney.—Mean temp. of air 0°·1 below, and R 4·10 in. below, averages.

Wellington.—Mean temp. of air 0°·7 below, and R 2·25 in. below, averages.

Auckland.—R 1·50 in. above the average. A wet and stormy month. Heavy gales doing much damage on 2nd, 3rd, 20th and 21st.